of these matters, but we are quite ready to be convinced by proven facts. Prove to us this devil's work, and we acquiesce in your conclusion. But do not put us off with a logical "must be," the recognized symbol of an assumption. Do not tell us that since a hundred were born and only two survive, the ninety-eight must be in some way and for some reason unfit. This is just the very fact of which we require definite and indubitable evidence.

Now what solid and umimpeachable body of evidence have we wherewith to conclusively refute this scepticism? If animals or plants removed to a new environment assume a new habit, in how many cases is it clearly *proved* that this is due to the elimination of all those who failed to vary in the direction of this habit? It behoves us to be careful that the very strength of the natural selection hypothesis be not a source of weakness, by leading us to neglect the duty of experimental verification. That there should be a central institute or institutes for the purpose of such experimental verification, is what Dr. de Varigny and Dr. Romanes are pleading for. It would produce a salutary organization of research; for the institute would have carefully selected correspondents in all parts of the world who would carry out their experiments in concert. It would bring scattered energies to a focus. It would by its journal show individual workers where research is specially needed. It is bound to come sooner or later. We hope to see it an established fact before the close of the present century.

C. LL. M.

BRITISH FUNGUS FLORA.

British Fungus-Flora, a Classified Text-Book of Mycology. By George Massee. In 3 vols. Vol. I. (London and New York: George Bell and Sons, 1892.)

IT was in 1836 that Berkeley published his "British Fungi" as a part of Hooker's "British Flora," and for about a quarter of a century this was the standard work. In 1860 appeared Berkeley's "Outlines of British Fungology," which from the first was disappointing, inasmuch as it was only a barren catalogue for all except the large and conspicuous species; and even the latter were so compressed in description, by the exigencies of confining the book within narrow and definite limits, that it did not wholly supersede the use of the old "British Fungi." In 1871 an effort was made to repair the error by the publication of Cooke's "Handbook of British Fungi," which brought the whole subject up to date, and gave a new impetus to British mycology. On account of the considerable acquisition of species, new to the British flora, it was deemed fitting in 1871 to produce a new work which should include these additions, and then Stevenson's "British Fungi" appeared. This new work only included the "Hymenomycetes," or, in effect, part of the first volume of Cooke's "Handbook," leaving all the rest untouched. In order to remedy this deficiency in part, Cooke's "Myxomycetes" was issued in 1877, and Phillips' "Manual of British Discomycetes" in 1887. Meanwhile a second edition of a portion of Cooke's "Handbook" was being issued as a supplement to "Grevillea," but confined exclusively to the *Agaricini*. With the exception of Plowright's "British Uredineæ" published in 1889, all the rest of the orders contained in the "Handbook" remained as they were in 1871. The unrevised portions included the *Pyrenomycetes*, or Sphæriaceous fungi; the *Sphæropsideæ*, or imperfect Pyrenomycetes; and the *Hyphomycetes*, or moulds. Hence the announcement of a complete work which should include *all* the British fungi, of whatever denomination, brought up to date, did not come as a surprise.

The volume before us consists of 430 pages, and professes to be the first of three volumes, which are to contain the whole "British Fungus Flora" in full, and upon the same plan as this first volume. We have heard of wonderful feats of "strong men," but these will be nothing in comparison to the feat which is ostensibly promised on the title-page, *when* it is accomplished. In our simplicity we should have calculated *six* volumes as nearer the minimum. If the result proves to be *less*, we shall be content to bear the odium of a false prophet. We may premise that the author who has undertaken the present work is eminently fitted to carry it out successfully, inasmuch as he is a practical field naturalist, with independent views, and by no means afraid of hard work.

To return to the volume in question, we must recognize clearness of typography, and distinctness in the isolation of species, which will facilitate reference and increase its practical utility. The illustrations are rather rough outlines, but quite sufficient for practical purposes, and will exhibit the distinctions between the several genera as far as illustrations can do it. Of the systematic arrangement we are not prepared to speak so highly, but perhaps some may consider this a matter of detail. The contents may be summarized thus, in the order of their appearance. The *Gastromycetes*, or puff-ball fungi, commencing with the subterranean species, followed by the *Sclerodermeæ* and the *Nidularieæ*, then the *Lycoperdeæ*, concluding with the *Phalloideæ*. These are succeeded by the *Hymenomycetes*, in like manner inverted, commencing with the *Tremellineæ*, and backwards through the other families to the *Agaricini*, which are commenced in the last 120 pages, but not half completed. We imagine that half another volume will be required to complete the *Basidiomycetes*.

Under ordinary circumstances, when we take up a flora, we are accustomed to meet with the adoption of either one of two methods. The one consists of a regular sequence, from what the author regards as the highest developments in his congeries to the lowest; the other an equally regular sequence from the lowest to the highest. This is conventional, but the present book is not conventional. In one sense there undoubtedly is a regular sequence from the lowest forms to the highest in the *Basidiomycetes*, which this volume contains; but we must not infer that Mr. Massee regards the *Basidiomycetes* as the lowest order of Fungi, or that he commences with the simplest organisms, proceeding upwards by regular gradations to the most complex, when he starts with the *Gastromycetes*. Undoubtedly our author has not made a special study of the puff balls in order to degrade them to the lowest rank. Hence we can only arrive at one conclusion, and that is, that such portions of the work have now been printed as were ready for the press, and no conclusions are to be drawn from the sequence adopted as a convenience, as if it were adopted by premeditation.

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Continental mycologists have now for some time accepted the genera of the *Agaricini* as defined by Fries, with the exception of the large genus *Agaricus*, which Fries himself subdivided into numerous smaller groups as subgenera; but they have elevated all these smaller groups to the rank of genera, and placed them upon an equality with the other veritable genera of *Agaricini*. Against this metamorphosis we feel bound to contend, on the ground that the distinctions, although sufficient for the subdivision of a genus, are not of generic value, and that the genera so constituted are unnecessary, and of unequal value, with the old genera beside which they are placed. For instance, *Amanitopsis* differs only from *Amanitæ* in the absence of a ring; and *Annellaria* differs only from *Panæolus* in the presence of a ring. Let any one of practice and experience compare these pseudo-genera with *Coprinus*, *Cantharellus*, or *Schizophyllum*, and judge of what we say. For the first time these pseudo-genera now find a place in a British flora, and, although not of overwhelming importance, we cannot permit them to pass without protest.

Spore measurements are a recent addition to the diagnoses of *Hymenomycetes*, and, although we contend that they should be employed with caution and discrimination, it is very satisfactory that so much attention should have been given to them in this work. Not only does the spore vary in size in a given species in different seasons, but at different periods in the same year. This is certainly true in some species which have been tested, and should lead us to accept spore measurements as approximate rather than absolute.

In conclusion, we are bound to remark that this is a student's book, written with a full appreciation of the wants of a student, and giving all the information which a student might require. In all cases, whether under families, genera, or species, will be found just the details which the novice will be most anxious to obtain, and, although the study of these interesting but rather difficult plants has been of late somewhat upon the decline, we doubt not that it will revive and prosper by the aid of the new "British Fungus Flora," which will become the "text-book of British mycology." M. C. C.

SOUTH AFRICAN SHELLS.

Marine Shells of South Africa: A Catalogue of all the Known Species, with References to Figures in Various Works, Descriptions of New Species, and Figures of such as are new, little known, or hitherto unfigured. By G. B. Sowerby, F.L.S., F.Z.S. Pp. 89, 5 pls. [drawn by the author]. (London, 1892.)

SINCE 1848, when Krauss published his well-known work, entitled "Die Südafrikanischen Mollusken," no such list as the one before us dealing with the Molluscan Fauna of this interesting and important marine province has appeared.

Krauss, who included the non-marine forms of the South African region in his work, recorded 403 marine species, of which 213 were considered to be peculiar to the province. Many other species have been subsequently cited or described as coming from that quarter, notably by E. von Martens and by our present author.

Conchologists undoubtedly owe much to Mr. Sowerby for thus bringing together within the small compass of this single volume, the scope and aim of which are sufficiently indicated in its title, the scattered records of the various species as known to him; but they will equally regret that the author did not include the whole molluscan fauna instead of confining himself to the testaceous forms, and thereby raise the work from the level of a mere shell-collector's catalogue to the rank of a work of reference of real scientific value.

Mr. Sowerby enumerates 740 species, and estimates that 323 of these are confined to South Africa, whilst 67 also occur in European seas, and 340 have been found on other coasts. Unfortunately, it is our disagreeable duty to point out that this record does not include "all the known species," and hence is not what the author fully intended it to be, viz., "as complete as possible." An important paper by Von Martens[1] appears to have been overlooked, for there are about thirty species named in it, including some which were then new, not mentioned by Mr. Sowerby. Still more remarkable is the omission of the new forms described by Mr. Watson in his report upon the Scaphopoda and Gastropoda, obtained during the voyage of the *Challenger*. Davidson's "Monograph of recent Brachiopoda," had it been more closely scanned, would have yielded not only two species reputed to have come from the Cape, but also *Terebratulina Davidsoni*, King, the type specimens of which, dredged on the Agulhas Bank, were passed on to their describer by Mr. G. B. Sowerby (the elder, we presume) in 1871.

A number of species have been recorded by Mr. E. A. Smith in an appendix to a "Report on the Marine Molluscan Fauna of the Island of St. Helena,"[2] as found there on what is locally known as "Sea-horn." This substance appears to consist of portions of a large species of Tangle, probably *Echlonia buccinalis*, which occurs at the Cape, whence it drifts to St. Helena. Some allusion should have been made to these forms. Hints might also have been gleaned from the same report, which deserves to be more widely known than seemingly it is, of undoubted South African species whose names do not appear in Mr. Sowerby's catalogue.

The presence of a good index, while it obviates the necessity, does not abolish the desirability of a good classification, and, in the present state of our knowledge in matters conchological, that of Woodward's Manual is hardly up to date; it is somewhat late in the day to find *Dentalium* still in its old place in the Gastropoda.

Some few changes in nomenclature are made in deference to the law of priority, and these are set forth at the end of the preface. Amongst them is *Ovula*, Bruguière, 1789 = *Ovulum*, Sowerby, &c., though, according to some, *Ovula* is itself a synonym for *Amphiperas*, Gronovius, 1781; *Calliostoma* is erroneously attributed to Bruguière instead of Swainson.

There are also some oversights in the text, as, for instance, "*Columbella cerealis*, Menke (Buccinum), Krauss ... = *C. Kraussii*, Sowerby," where, since Menke's name was given merely in MS., Sowerby's name stands, having four years' priority over Krauss's; *Triforis* is treated as though of the masculine gender; whilst the references to "figures in various works" require careful checking.

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[1] "Ueber einige südafrikanische Mollusken nach der Sammlung von Dr. G. Fritsch." Jahrb. Deutsch. Malak. Gesell. 1874, pp. 119–146.

[2] Proc. Zool. Soc. 1890, pp. 247–317.

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